IN THE SPECIFICATION

Please amend the specification of the instant application as follows:

[0019] In accordance with one or more further aspects of the present invention, an apparatus includes: an automatic mixer circuit operable to produce a control signal usable to adjust respective gains of a plurality of audio channels based on an aggregate of input levels of respective audio signals of the audio channels; a respective first summing circuit for each audio channel operable to produce a first error signal that is a difference of a signal indicative of the input ~~a~~ level of the audio signal of the respective audio channel and the control signal from the automatic mixer circuit; a respective second summing circuit for each audio channel operable to produce a second error ~~voltage~~ signal that is an aggregate of the signal indicative of the input level of the audio signal of the respective audio channel and a signal indicative of a threshold level for the respective audio channel; and a voltage controlled amplifier for each audio channel that is (i) responsive to the respective first error signal to reduce the gain of the respective audio channel when the control signal has a greater magnitude than the signal indicative of the input level of the respective audio signal, and (ii) responsive to the respective second error signal to reduce the gain of the respective audio channel when a magnitude of the signal indicative of the input level of the audio signal of the respective audio channel approaches and/or reaches a magnitude of the signal indicative of the threshold level for the respective audio channel, irrespective of whether the control signal of the automatic mixer would permit the gain to rise higher.

[0021] In accordance with one or more further aspects of the present invention, a method includes: automatically mixing a plurality of audio channels by adjusting respective gains of the audio channels using a control signal based on an aggregate of input levels of respective audio signals of the audio channels; producing a first error signal in each of at least some of the audio channels that is a difference of a signal indicative of the input ~~a~~ level of the audio signal of the respective audio channel and the control signal; producing a second error ~~voltage~~ signal in each of the at least some audio channels that is an aggregate of the signal indicative of the input level of the audio signal of the respective audio channel and a signal indicative of a threshold level for the respective audio channel; automatically responding to the respective first error signal to reduce the gain of the respective audio channel when the control signal has a greater magnitude than the signal indicative of the input level of the respective audio signal: and automatically responding to the respective

second error signal to reduce the gain of the respective audio channel when a magnitude of the signal indicative of the input level of the audio signal of the respective audio channel at least one of approaches and reaches a magnitude of the signal indicative of the threshold level for the respective audio channel, irrespective of whether the control signal of the automatic mixer would permit the gain to rise higher.

[0033] The compression circuit 110 monitors the level of the input signal on line SIGNAL IN in order to further control the gain of the VCA 112. Although the compression circuit 110 could be designed to receive the input signal from SIGNAL IN directly, it is preferred that the compression circuit 110 receives the signal on line 120, which is indicative of the input level of the audio signal on the SIGNAL IN line. The compression circuit 110 also receives a threshold signal on line 126. The compression circuit 110 is preferably operable to produce an error ~~voltage~~ signal on line 128 based on an aggregate (e.g., a summation, a difference, or a comparison) of the input signal level from line 120 and the threshold signal on line 126. For example, the compression circuit 110 may compare these two signals to produce a rapid change in the value of the error signal on line 128 and corresponding change in the gain of the VCA 112. As such a rapid change may not be most pleasing to a listener, it is preferred that the compression circuit 110 produces an error ~~voltage~~ signal on line 128 that is an aggregate of the level of the input signal from line 120 and the threshold signal on line 126. It is most preferred that the error signal on line 128 remains substantially unchanged while the level of the signal on line 120 (e.g., the SIGNAL IN level) is significantly different from the level of the threshold signal on line 126. Under these conditions, the error signal on line 128 does not substantially affect the gain of the VCA 112. When the level of the input signal on line 120 approaches the threshold signal, however, it is preferred that the magnitude of the error ~~voltage~~ signal on line 128 changes and causes the gain of the VCA 112 to reduce, irrespective of whether the control signal on line 124 would permit the gain of the VCA 112 to rise higher. In this sense, it is preferred that the compression circuit 110 has priority in setting the gain of the VCA 112, or at least has priority over the resultant gain as compared to the automatic mixer 102.

[0034] The operation of the automatic mixer and channel compression circuit 100 will now be discussed further in connection with several examples. In a first example, it is assumed that the circuit 100 includes two audio channels, where each channel includes an audio channel circuit 104 and each such circuit receives a control signal from the automatic mixer 102. It is further assumed

that only one channel is active. Thus, in the active channel, the magnitude of the signal on line 120 and the magnitude of the control signal on line 122 will be substantially the same. Thus, the difference of these magnitudes as reflected in the error signal on line 124 will be approximately 0. Assuming that the level of the input signal in the active channel is not significantly near the level of the threshold signal on line 126, then the gain of the VCA 112 will be substantially controlled by the error signal on line 124 (as opposed to the error signal on line 128). Under these circumstances, the error signal on line 124 of the active channel preferably commands a maximum gain of the VCA 112 as compared with the gain of the VCA 112 of the inactive channel. Indeed, in the inactive channel, the level of the input signal on line 120 is 0, while the level of the control signal on line 122 is substantially the same level as the input signal of the active channel. Thus, the level of the error ~~voltage~~ signal on line 124 in the inactive channel is relatively high in a direction that substantially reduces the gain of the VCA 112 in that channel.

[0037] In each of the above examples, it was assumed that the respective input signal level in each active channel was not significantly near the respective threshold signal in each channel. However, if any of the input signals were to increase significantly towards the level of the threshold signal on line 126, then the error signal on line 128 of the particular channel would adjust the gain of the VCA 112 in that channel downward, despite that the automatic mixer 102 would tend to want to keep the gain of the VCA 112 at a higher level. Indeed, the tendency of the automatic mixer 102 is to cause the VCA 112 in a particular channel to increase its gain in response to a higher input level on the SIGNAL IN line. Recall that the compression circuit 110 produces an error ~~voltage~~ signal on line 128 based on an aggregation of the level of the input signal from line 120 and the threshold signal on line 126. When the level of the input signal on line 120 approaches the threshold signal on line 126, the magnitude of the error ~~voltage~~ signal on line 128 changes and causes the gain of the VCA 112 to reduce, irrespective of whether the control signal on line 124 would permit the gain of the VCA 112 to rise higher.